

Written communication about the use of medications in medical records during patients' hospitalization in Brazil

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Abstract

Background. Effective communication regarding the use of medications in a hospital environment is a process that contributes to the promotion of patient safety. Despite its importance, especially for medication reconciliation, written communication about the use of medications in medical records remains insufficiently investigated. **Aim.** To describe the documentation in medical records regarding the medication use process by pharmacists, physicians and nurses on admission, during the hospital stay, and on hospital discharge. **Method.** A retrospective cross-sectional chart review study was carried out in medical records of patients admitted to a teaching hospital in Northeast Brazil. The study considered all patients admitted between December 2016 and February 2017, aged 18 or older and hospitalized for at least 48 hours. The clinical notes made by pharmacists, physicians and nurses were examined at three transition points of care. Data were collected using a developed questionnaire and aimed at gathering the use of medications prior to hospital admission, changes in the prescribed medications in hospital stay and discharge, as well as prescription non-conformities. Non-conformities were considered as any irregularities reported by the healthcare team involving the medication use process. Communication failures between the three healthcare professionals were also analyzed and classified. **Results.** This study included 202 patients with a mean age of 51.48 (SD 6.42, range: 19-97) years. There was no record of a patient or relative interview on allergies and adverse drug reactions in 54 (26.8%) physician notes, 44 (21.9%) nursing notes, and 8 (22.9%) of pharmacist notes. Moreover, 1,588 changes in prescriptions were identified during data collection, but only 390 (24.5%) of these changes were justified. **Conclusion.** Medication-related information in medical records was incomplete and inconsistent in the clinical notes of the three studied professions, especially in the pharmacists' documentation. Future studies should focus on investigating the consequences of interprofessional communication in patient care.

INTRODUCTION

Effective communication regarding the use of medications in hospital environments is a dynamic and complex process that contributes to the promotion of patient safety.¹ Regarding communication between the healthcare team, Manias et al. (2016) highlights that when patient information is complete, the continuity of care can be ensured, especially at transition points of care.²

In this context, the medical record should be the main document that mirrors the patient's history, from hospital admission to discharge, allowing the continuity of care.^{3,4} Mathioudakis et al. (2016) point out that accurate medical record keeping is integral to good professional practice and the delivery of quality

healthcare.⁵ According to these authors, medical records must describe treatment details and future treatment recommendations besides every medication administered, prescribed or renewed and any drug allergies.

Recent evidence suggests that when the medical record is not well documented, the transfer of information among healthcare professionals may be impaired.⁶ Communication failure, defined as a flaw in the content, audience, occasion or purpose of the communication act, has been widely reported regarding the use of medications.^{4,7–10} Furthermore, documentation gaps can cause medication errors, such as unintended medication discrepancies. These occur when there is a change in the pharmacotherapy without clinical justification in the transition points of care, or when the intentionality of the change is not recorded.^{11,12} Thus, medication reconciliation emerges as the most effective strategy to solve such issues.^{13–15}

The literature points out challenges related to the implementation and consolidation of medication reconciliation, with the quality and reliability of the recording of medication information described as challenges still to be overcome.^{8,16–18} Ideally, all medications that the patient uses before, during and after hospitalization should be documented in the medical record, as well as any changes and justifications for them, improving the communication between the healthcare team.^{3,19} Complete documentation ensures that relevant information for healthcare decision making is available, providing effective evaluation and monitoring of treatment, decreasing episodes of medication omissions and therapeutic duplicity.^{20,21}

There are legal issues to ensure good quality documentation recommendations for the United Kingdom, Australia, most of the United States, France and other countries.⁵ In Brazil, studies evaluating the quality and content of medical records are still scarce. Lack of research in this area means that it is difficult to understand how information contained in medical records affects assessment of adverse events and medication errors.^{22–25} Thus, the present study aimed to describe the documentation in medical records regarding the medication use process by pharmacists, physicians and nurses on admission, hospital stay, and hospital discharge.

METHODS

Design

We conducted a retrospective cross-sectional, chart review study on the documentation of use of medications in medical records.

Sample/Participants

The study was carried out in a teaching hospital in Northeast Brazil. The studied wards were: General Medicine, Intensive Care Unit, and Surgical wards. Pharmacists, physicians and nurses worked in all wards, as well as medical residents and other healthcare professionals. We included all patients admitted to the hospital from December 2016 to February 2017 and met the following eligibility criteria: 1) being over 18 years of age and 2) being hospitalized for at least 48 hours in one of the study wards.

Data collection

Pilot study

In the planning phase of the study, a data collection form was developed using admission, hospitalization and hospital discharge variables extracted from similar studies found in the literature.^{7,26–28} Subsequently, the form was piloted, with a convenience analysis of 92 medical records of patients admitted in the second quarter of 2016, following the same eligibility criteria and in the same study location. Data were analyzed by two independent observers (L.M.C.S. and F.C.J.J.) under the supervision of a third researcher (C.C.S.). Then, the form was expanded to include more information regarding medication use at admission, hospitalization and discharge.

Main measures

The data were collected from April to August 2017. Before data collection, two study coordinators (L.M.C.S. and C.C.S.) trained a team of research assistants (A.S.D., G.A.C.C., L.A.M., R.O.S.S. and T.S.A.) to

properly apply the data collection form and clarified their questions. The research assistants were pharmacists and researchers, members of the same research group. All medical records were assessed by the team. Cases of divergence regarding the communication failure were resolved by consensus among them.

All data were manually reported in paper medical records which contained all medications prescribed during the hospitalization. The clinical notes made by pharmacists, physicians and nurses, and healthcare professionals involved in the use of medications, were examined at three transition points of care (hospital admission, during the hospital stay, and hospital discharge).

At hospital admission, data were collected from admission forms or, when they were not present, from the first medical note in the patient medical record. Pharmacists and nurses' notes from the first day of hospitalization were also considered as sources of information for hospital admission as well the physician's notes. We considered admission as the first day of hospitalization, and hospital stay from the following days. During the hospital stay, data were extracted from medications prescriptions, pre-anesthetic evaluations, forms requesting other expert opinions and the pharmacists', physicians', and nurses' notes. At hospital discharge, only information presented in the hospital discharge form was evaluated or, when it was not present, the last registered clinical note of a pharmacist, physician, or nurse was considered.

Variables

The data collection step was carried out through a form developed and structured by the research team, that included general patient information (age, sex, ward, nature of hospitalization, hospitalization days, and reason for hospitalization) as well as the following variables. The variables collected from admission clinical notes were: allergies and/or adverse drug reactions; the use of medications prior to hospital admission, including dose, frequency and treatment duration; changes in the use of medications that the patient used before hospital admission, classified according to the type of change (modification or suspension), as well as whether this change was justified; and which time these information were recorded (e.g. admission, hospital stay or hospital discharge).

In turn, the variables from the hospital stay clinical notes were: transfers to other wards in the same institution during hospitalization; changes in the prescribed medications, such as changes of dose, frequency, route of administration, additions, substitutions and suspensions of medications and the justification for such alterations; changes in the prescriptions as a consequence of the intervention of another professional, and whether this suggestion was accepted; referrals to other professionals suggesting interventions in pharmacotherapy; and prescription non-conformities. Non-conformities were considered as any irregularities reported by the healthcare team involving the medication use process. For each professional, considering their specific responsibilities, we assessed different reports in order to classify them as "non-conformities" as below:

- Nurses - non-administration of medications, report of adverse drug events, symptoms that suggests need of pharmacotherapy modification, changes in drug administration time, and route of administration;
- Pharmacists - report of drug interactions, drug-related problems, adverse drug events, symptoms that suggests pharmacotherapy modification, and changes in drug administration time;
- Physicians - absence of written report of justification for pharmacotherapy changes.

Regarding the hospital discharge clinical notes, the following variables were analyzed: changes between the medications used by the patient prior to hospital admission and those prescribed at discharge, classified according to the type of change (modification or suspension), and if there was justification provided for its change; changes in discharge prescriptions as a consequence of the intervention of another professional, and whether this suggestion was accepted; and counter-referral for the patient after hospital discharge.

Data analysis

Data were analyzed for duplications and inconsistencies using Microsoft® Excel for Mac Version 15.19.1 (160212). With the help of this software, the categorical and continuous variables were subjected to descriptive statistical analysis, by calculating frequency counts, percentages, means, standard deviations, minimum

and maximum values, and confidence intervals.

Analysis of communication failures

The clinical notes of pharmacists, physicians and nurses were also analyzed to identify communication failures about medications. This analysis was performed according to the studies by Manias et al. (2016) and Lingard et al. (2004).^{2,7} Based on this approach, notes regarding the medication use process were transcribed, analyzed and classified.

RESULTS

In total, 424 patients were admitted to the hospital in the studied wards. Of these, 202 (47.6%) patients met the inclusion criteria and had, therefore, their medical records analyzed. A total of 222 patients were excluded from the final sample for the following reasons: patient discharged in less than 48 hours (n=208, 49.0%), medical records not found (n=8, 1.9%) or patients aged under 18 years old (n=6; 1.4%).

Of the 202 records analyzed, 121 (59.9%) were from female patients and had a mean age of 51.48 (SD 16.42, range: 19 to 97) years. Table 1 shows the complete patients' characteristics. The most prevalent reason for hospitalization was cholelithiasis surgery or obstruction of the biliary tract (with or without cholecystitis) (n=20, 9.9%), followed by breast cancer (n=9, 4.4%), benign thyroid neoplasm (n=8, 3.9%) and chronic obstructive pulmonary disease (n=8, 3.9%).

[INSERT TABLE 1]

Documentation of pharmacists', physicians' and nurses' clinical notes in medical records

Hospital admission

At hospital admission, the pharmacist was the professional who least recorded the medications used prior to admission, with a mean of 2.6 SD 4.5 (0 to 22) days of delay to report such information in the medical record. Table 2 shows the report of medication-related information present in the clinical notes of pharmacists, physicians and nurses.

Regarding the record of medications used by the patient prior to admission, 86 changes were identified. These changes were classified as: suspension of these medications (n=64, 74.4%); and alteration of dose, frequency or route of administration (n=22, 25.6%). Furthermore, the timing of documentation was different among the healthcare professionals. While physicians and nurses reported information on allergies and adverse drug reactions predominantly on admission, pharmacists reported this information in 44.4% (n=12) of their admission clinical notes. Pharmacist records on the patients' previous pharmacotherapy were also identified mainly during the hospital stay (n=18, 64.3%).

[INSERT TABLE 2]

Hospital stay

Regarding the prescribed medications during hospitalization, 1,588 changes were identified, with an average of 9.45 (I.C. 95%; 7.71 to 11.19) changes per patient. Only 390 (24.5%) of such changes were justified. Of the justified changes, most were the addition of medications (n=199, 51.0%), followed by treatment suspension (n=84, 21.5%) and adjustments in dose (n=50, 12.8%). Furthermore, 29 justified changes related to recommendations made by physicians, two related to nurses, and one related to pharmacists. The recommendations of these professionals were accepted in all 32 cases.

In 48 (23.7%) of the 202 medical records, there were 116 non-conformities related to medications in the nurses' clinical notes. In addition, 59 direct references to other professionals were observed. The physicians were the most mentioned (n=39, 66.1%), followed by nurses (n=19, 32.2%) and nutritionists (n=1, 1.7%). From the references described, 26 (44.0%) indicated interventions in the patients' pharmacotherapy. Among the actions suggested, the suspension of medication administration, given the patients' clinical condition and changes in administration time by physician orders, were observed.

Only 11 (5.4%) medical records contained a pharmacist report of non-conformities related to the use of medications. Seventeen non-conformities were identified, of which four (25.0%) related to the risk of drug interactions, three (18.7%) to the identification of medication discrepancies and two (12.5%) to allergic reactions after medication administration. In addition, the pharmacist documented the conduct performed to solve eight (50%) of these non-conformities. Reference to the physician was found in three cases.

Hospital discharge

Hospital discharge reports showed that, of the 202 patients, 93 (46.0%) had a medication prescribed for discharge. Of these 93 prescriptions, 22 (23.7%) were new medications and 71 (76.3%) of the prescriptions presented changes between the medications used prior to hospital admission and those prescribed at discharge. Of these changes, only 35.1% (n=77) had a justification, similar to the justified changes found in hospital stay, in which addition of medications were the most prevalent (73%), followed by treatment suspension (12%) and adjustments in dose (9%).

The present study also verified that, in 13 (18.3%) discharge prescriptions, changes between the patient's previous medication and medications that the patient would use after hospitalization were made by the intervention of other medical specialties. Of these changes, only nine made direct reference to the physicians who suggested them, and they were accepted in all cases.

When assessing the nurses' discharge notes, we found only one (0.4%) discharge medication was documented. The report was related to a continued treatment with an antiretroviral drug. No records were found on the medication use after discharge in the pharmacists' clinical notes. In addition, record of counter-referrals at hospital discharge was observed in 161 (79.7%) physicians' clinical notes, followed by one (0.4%) nurse's clinical note, and no pharmacists' documentation was found.

Communication failures in medical records

Table 3 defines the types of communication failures and shows examples extracted from medical records.

[INSERT TABLE 3]

DISCUSSION

To the best of our knowledge, this is the first study to describe written communication about medication use during admission, hospital stay and discharge in Brazil. Our findings show some gaps in documentation that may have compromised the understanding of medication use processes within the hospital environment.

The physicians' and nurses' clinical notes were present in almost all medical records analyzed, while the pharmacists' documentation was less prevalent. Other studies have shown that pharmacists are less likely to document their interventions.²⁹⁻³³ Deficiencies in training, lack of involvement in the healthcare team, as well as clarity of work processes are factors that may influence this finding. Furthermore, Rixon et al. (2014) states that the healthcare team prefers spoken communication over pharmacists' written communication when searching for immediate medication information.³¹ In light of this view, it becomes unclear what are the pharmacists' roles in a multiprofessional patient care environment, since the gaps of documentation do not allow a proper analysis of their interventions. This omission may impair patient care, considering that the integration of pharmacists into core healthcare teams seemed to facilitate better health outcomes, better team decision making regarding medication use, improved continuity of care and patient safety.^{2,29,40-43,31,32,34-39}

Most nurses' and pharmacists' notes did not present information on the medication use at admission and hospital discharge, especially the absence of treatment duration. Omission of relevant information on the use of medications may increase days of hospitalization, lead to treatment interruptions and compromise patient safety.⁴⁴⁻⁴⁸ Studies show that omissions occur frequently when health professionals do not question about medication use or when they fail to record the patient's answer on this matter.^{48,49,58-61,50-57} Moreover, it is important that health professionals have clarity of their roles and know what information regarding their expertise must be reported in medical records. This clarity enables continuity of care, considering that, in the medication use process, one professional could depend on others' evaluation. If the healthcare team wants to

work collaboratively, complete documentation is essential to enable a more reliable decision-making process regarding patient care.

A notorious number of changes in medication use before and during hospitalization was observed, as well as other studies in literature.^{3,62–65} However, only a few changes had written justifications. The absence of such information compromises the intentionality analysis of the discrepancies, which impairs medication reconciliation and patient safety. The New South Wales Therapeutic Advisory Group has used documented justifications as a quality indicator for medication use in Australian hospitals, which highlights their importance in driving improvements within the contemporary practice.⁶⁶

Most medical records presented some type of deficiency in written communication among the professionals evaluated. Vermeir et al. (2015) emphasize that, although spoken communication among healthcare professionals is essential, in clinical practice, written communication remains the most common means of interaction among them.⁶⁷ Manias et al. (2016) associated communication fails with institution challenges and interprofessional relationships.² Future studies should be directed to the analysis of the dimensions of communication and how these might interact to promote an efficient transfer of information regarding medications use in hospital settings.

Given the challenges related to documentation, electronic medical records and information software packages have been shown as strategic tools to assist written communication. Their use has been reported to improve interprofessional communication, decrease medication errors and length of intensive care unit stay.^{68–73} In Brazil, most medical records are paper based as it was in the studied hospital.^{74,75} The use of paper charts is associated with problems such as prescription illegibility and incompleteness of patient information.⁷⁶ Some studies indicate that the quality of documentation does not necessarily depend on the adoption of electronic medical records, as it depends on the quality of the process, and, thus, healthcare professional training is required to make good documentation, with the electronic medical records as tools in this process.^{77–81} Although electronic medical records are recognized as an important strategy for time optimization, their adoption should aim at the integration and qualification of documentation processes, maximizing interaction with the most accurate source of the information - the patient.^{82,83}

The present study has strengths and limitations. We conducted an analysis of documentation of the three professional groups (nurses, physicians, pharmacists) who were directly involved in medication use processes. In addition, the investigation of the completeness of medication-related information in transition points of care is another important factor that deserves to be emphasized.

This study also has some limitations since we did not investigate the clinical relevance of the completeness of information in hospitalization, which could be useful to assess the risks of absent information for patient safety. Another limitation was the lack of proportional analysis of the number of healthcare professionals in the study setting, which could enrich the interpretation of findings.

CONCLUSION

Our findings revealed that medication-related information in medical records was incomplete and inconsistent in the clinical notes of the three studied professions, especially in the pharmacists' documentation. These written communication failures may compromise patient safety, considering that medical records should legally describe healthcare professionals' work processes. Once this study found several gaps, we highlight an alert for failures in these professionals' practices. Future studies should add depth to these discussions, investigating the consequences of interprofessional communication in patient care.

AUTHORSHIP

LMCS, CCS and LAM were major contributors in writing the manuscript, responsible for study concept and design, acquisition, analysis and interpretation of data, and drafting of the manuscript. DMMP, ADOF and DPLJ also contributed to the study concept and design, drafting of the manuscript, and critical revision of the manuscript for important intellectual content. LMCS, CCS and LAM performed the analysis and interpretation of data. EM substantively revised the manuscript for important intellectual content. All authors

have read and approved the submitted version of the manuscript. All authors have also agreed both to be personally accountable for their own contributions, and to ensure that questions related to the accuracy or integrity of any part of the work were appropriately investigated and resolved.

Ethics and other permissions

The study was authorized by the Hospital's Board of Directors and approved by the Research Ethics Committee of the Federal University of Sergipe under the number 08125912.5.0000.0058. The collected data were for exclusive use of the researchers having secured the confidentiality of information obtained in accordance with the resolution CNS n^o. 466/2012.

Conflict of interests

No known conflict of interests.

Data availability statement

The datasets used and/or analysed in the current study are available from the corresponding author on reasonable request.

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Table 1. Characteristics of patients admitted to General, Intensive Care Unit, and Surgical wards of a teaching hospital in Northeast Brazil. [n=202]

Variables analyzed	N (%)
<i>Gender</i>	
Feminine	121 (59.9%)
Masculine	81 (40.1%)
<i>Age</i>	
18 – 29 years	21 (10.4%)
30 – 39 years	30 (14.9%)
40 – 49 years	41 (20.3%)
50 – 59 years	47 (23.3%)
60 – 69 years	38 (18.8%)
More than 70 years	25 (12.3%)
<i>Nature of hospitalization</i>	
Admitted from home	192 (95.0%)
Admitted from another hospital	10 (5.0%)
<i>Ward</i>	
Surgical	124 (61.4%)
General	77 (38.1%)
Intensive Care Unit	1 (0.5%)
<i>Hospitalization days</i>	
1 – 4 days	103 (51.0%)
5 – 9 days	40 (19.8%)
10 – 14 days	25 (12.4%)
15 – 19 days	9 (4.4%)
20 – 24 days	11 (5.4%)
25 – 29 days	7 (3.5%)
More than 30 days	7 (3.5%)
<i>Transfers to other wards</i>	
Intrahospital	15 (7.4%)
Interhospital	1 (0.5%)

N = number of patients

Table 2.

Medication-related information present in the clinical notes of pharmacists, physicians and nurses of a teaching hospital in Northeast Brazil.

Variables analyzed

Total number of records

HOSPITAL ADMISSION

Written record of allergies and/or adverse drug reactions

Written record of the use of medications prior to admission

Patient denies the use of medications prior to admission

Dose

Frequency

Treatment duration

HOSPITAL STAY

Non-conformities related to medication use process

Referrals to other professionals suggesting interventions in pharmacotherapy

HOSPITAL

DISCHARGE

Report of medications use after hospitalization

Counter-referrals

Table 2.

Medication-related information present in the clinical notes of pharmacists, physicians and nurses of a teaching hospital in Northeast Brazil.

Nurses' clinical notes

n (%)

201 (99.5%)

157 (77.7%)

56 (27.7%)

12 (5.9%)

8 (4.0%)

6 (3.0%)

1 (0.5%)

48 (23.7%)

28 (13.8%)

1 (0.4%)

1 (0.4%)

Table 2.

Medication-related information present in the clinical notes of pharmacists, physicians and nurses of a teaching hospital in Northeast Brazil.

Pharmacists' clinical notes

n (%)

35 (17.3%)

27 (13.4%)

28 (13.9%)

5 (2.5%)

16 (7.9%)

15 (7.4%)

1 (0.5%)

11 (5.4%)

10 (4.9%)

0 (0.0%)

0 (0.0%)

Table 2.

Medication-related information present in the clinical notes of pharmacists, physicians and nurses of a teaching hospital in Northeast Brazil.

Physicians' clinical notes

n (%)

202 (100%)

148 (73.3%)

167 (82.7%)

37 (18.3%)

102 (50.5%)

90 (44.5%)

13 (6.4%)

97 (48.0%)

32 (15.8%)

93 (46.0%)

161 (79.7%)

Abbreviation: NA, not applicable.

Table 3. Definition of types of communication failures with examples obtained from the medical records of General, Intensive Care Unit, and Surgical wards of a teaching hospital in Northeast Brazil. [n=485]

Failures	n	Context and transcribed record (<i>in italics</i>)
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Occasion (“when?”)	8	The pharmacist recorded guidance on the use of tramadol when the patient was no longer using it. Tramadol was suspended on the 3rd day of hospitalization, however the pharmacist recorded the guidance only on the 4th day. <i>”I warn that tramadol can intensify this condition of constipation”</i>
Audience (“who?”)	66	The nurse reported that losartan was not administered because the patient stated that it was suspended by the doctor, although the medication was present in the prescription of the day. <i>”The patient refused the medication losartan 50mg because he states that the doctor suspended it”</i> (Note: this report has been classified as having audience and purpose failures)
Purpose (“why?”)	98	In the nurse’s report, it was not possible to find clarity in the outcome of the non-administration of pregabalin, since the drug was no longer used several times during hospitalization due to lack. <i>”Patient refused pregabalin, I mean, the companion refused”</i>
Content (“what?”)	313	1) The patient reports using nine drugs at home. On the first day of hospitalization, the doctor prescribes eight medications, even recording that the previous pharmacotherapy would be maintained. <i>”I prescribe medicines I used at home”</i> 2) The patient reports having allergy to metoclopramide, but the doctor prescribes this medication for use when necessary.

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